1.

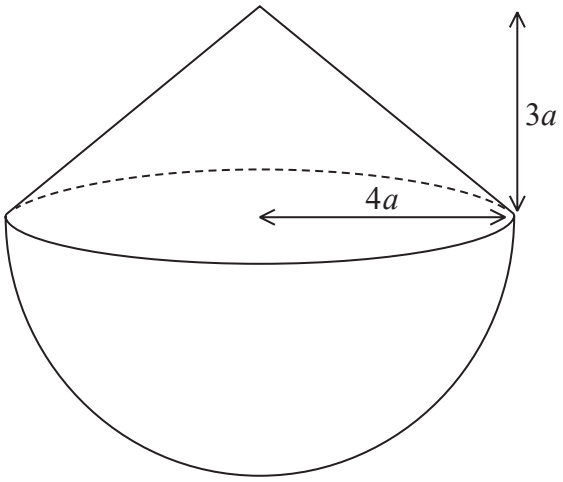


Figure 1

A hollow toy is formed by joining a uniform right circular conical shell C, with radius $4a$ and height $3a$, to a uniform hemispherical shell H, with radius $4a$. The circular edge of C coincides with the circular edge of H, as shown in Figure 1.

The mass per unit area of C is λ and the mass per unit area of H is $k\lambda$ where k is a constant.

Given that the centre of mass of the toy is a distance $4a$ from the vertex of the cone, find the value of k.

(6)

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Question 1 continued

(Total for Question 1 is 6 marks)

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